CLAIMS

We claim:

1. An image sensor, comprising:

a two-dimensional array of pixel elements, said array of pixel elements outputting pixel data representing an image of a scene; and

a two-dimensional array of selectively transmissive filters superimposed on said two-dimensional array of pixel elements, whereby each pixel element in said array of pixel elements is disposed to capture a first and a second color spectra of visible light.

2. The image sensor of claim 1, wherein said two-dimensional array of pixel elements comprises a two-dimensional sensor array of digital pixels, each of said digital pixels outputting digital signals as pixel data.

3. The image sensor of claim 2, wherein each of said digital pixels comprises a photodetector generating an output signal; and said image sensor further comprises:

a plurality of analog-to-digital conversion (ADC) circuits located within said array of pixel elements, each of said ADC circuits being connected to one or more photodetectors for converting said output signal to a digitized pixel voltage signal.

4. The image sensor of claim 1, wherein each of said pixel elements of said image sensor generates analog signals representative of said image as pixel data, and said image sensor further comprises an analog-to-digital converter for digitizing said analog signals.

5. The image sensor of claim 1, wherein each of said pixel elements in said array is overlaid with a transmissive

filter of a first type and a transmissive filter of a second type.

6. The image sensor of claim 5, wherein said two-dimensional array of transmissive filters is in offset registration with said two-dimensional array of pixel elements so that each filter overlies a portion of an active area of each of two adjacent pixel elements.

7. The image sensor of claim 1, wherein said two-dimensional array of transmissive filters comprises a two-dimensional array of filter cells, each filter cell superimposed and in registration with each of said pixel elements, each of said filter cells comprising a transmissive filter of a first type and a transmissive filter of a second type formed as four quadrants in an active area of said filter cell.

8. The image sensor of claim 7, wherein, in each filter cell, said transmissive filter of said first type occupies a first quadrant and a second quadrant diagonal from said first quadrant.

9. The image sensor of claim 1, wherein said array of transmissive filters is in registration with each of said pixel elements and each filter in said array of selectively transmissive filters is disposed to transmit visible light of said first color spectrum and visible light of said second color spectrum.

10. The image sensor of claim 9 wherein each filter in said array of transmissive filters has a spectral response representative of a spectral response of said transmissive filter of said first type and a spectral response of said transmissive filter of said second type.

11. The image sensor of claim 1, wherein said array of transmissive filter comprises a CMYG (cyan, magenta, yellow,

green) filter pattern and in a first set of pixel element, said first color spectrum comprises a cyan color and said second color spectrum comprises a green color.

12. The image sensor of claim 11, wherein in a second set of pixel elements, said first color spectrum comprises a cyan color and said second color spectrum comprises a magenta color.

13. The image sensor of claim 11, wherein in a second set of pixel elements, said first color spectrum comprises a yellow color and said second color spectrum comprises a magenta color.

14. The image sensor of claim 11, wherein in a second set of pixel elements, said first color spectrum comprises a yellow color and said second color spectrum comprises a green color.

15. An image sensor, comprising:

a sensor array comprising a two-dimensional array of pixel elements, said sensor array outputting digital signals as pixel data representing an image of a scene; and

a two-dimensional array of selectively transmissive filters superimposed on said pixel elements of said sensor array, whereby each pixel element is disposed to capture a first and a second color spectra of visible light.

16. The image sensor of claim 15, wherein each of said pixel elements comprises a photodetector generating an output signal; and said image sensor further comprises:

a plurality of analog-to-digital conversion (ADC) circuits located within said sensor array, each of said ADC circuits being connected to one or more

photodetectors for converting said output signal to a digitized pixel voltage signal.

17. The image sensor of claim 15, wherein each of said pixel elements in said array is overlaid with a transmissive filter of a first type and a transmissive filter of a second type.

18. The image sensor of claim 17, wherein said two-dimensional array of transmissive filters is in offset registration with said two-dimensional array of pixel elements so that each filter overlies a portion of an active area of each of two adjacent pixel elements.

19. The image sensor of claim 15, wherein said two-dimensional array of transmissive filters comprises a two-dimensional array of filter cells, each filter cell superimposed and in registration with each of said pixel elements, each of said filter cells comprising a transmissive filter of a first type and a transmissive filter of a second type formed as four quadrants in an active area of said filter cell.

20. The image sensor of claim 19, wherein, in each filter cell, said transmissive filter of said first type occupies a first quadrant and a second quadrant diagonal from said first quadrant.

21. The image sensor of claim 15, wherein said array of transmissive filters is in registration with each of said pixel elements and each filter in said array of selectively transmissive filters is disposed to transmit visible light of said first color spectrum and visible light of said second color spectrum.

22. A method for generating electrical signals representing an image in an image sensor comprising an array

of pixel elements overlaid with an array of selectively transmissive color filters, comprising:

generating at each pixel element pixel data indicative of the light intensity impinging on said pixel element, said pixel data being a sum of the light intensity of a first color spectrum and a second color spectrum of visible light.

23. The method of claim 22, wherein said pixel element generates digital signals as pixel data.

24. The method of claim 22, wherein said pixel element generates analog signals as pixel data.

25. The method of claim 22, wherein said array of selectively transmissive filter comprises a CMYG (cyan, magenta, yellow, green) filter pattern and said first color spectrum comprises a cyan color or a yellow color and said second color spectrum comprises a green color or a magenta color.

26. A method for displaying interlaced video images, comprising:

capturing an image of a scene using an image sensor comprising a two-dimensional array of pixel elements and a two-dimensional array of transmissive filters superimposed on said array of pixel elements; and

generating at each pixel element in odd rows of said array of pixel elements pixel data indicative of the light intensity impinging on said pixel element, said pixel data being a sum of the light intensity of a first color spectrum and a second color spectrum of visible light, said pixel data from said odd rows of pixel elements forming a first data field of said interlaced video images.

27. The method of claim 26, further comprising:

while said pixel data is being generated at said odd rows of said array of pixel elements, continuing to capture said image of said scene at even rows of said array of pixel elements.

28. The method of claim 27, further comprising:

generating at each pixel element in said even rows of said array of pixel elements pixel data indicative of the light intensity impinging on said pixel element, said pixel data being a sum of the light intensity of a third color spectrum and a fourth color spectrum of visible light, said pixel data from said even rows of pixel elements forming a second data field of said interlaced video images

29. The method of claim 26, wherein said pixel element generates digital signals as pixel data.

30. The method of claim 26, wherein said pixel element generates analog signals as pixel data.

31. The method of claim 26, wherein said array of selectively transmissive filter comprises a CMYG (cyan, magenta, yellow, green) filter pattern and said first color spectrum comprises a cyan color or a yellow color and said second color spectrum comprises a green color or a magenta color.